Multiple Choice Item Writing Review Baird, H. (1997). Performance Assessment for Science Teachers. SLC, UT: USOE.

The stem should pose a clear question or problem and should contain as much of the item as possible. It should be written as a question.

Poor: Evolution:

- a. was observed by Albert Einstein.
- b. was discovered by Charles Darwin.
- c. is a theory not accepted by everyone.

Better: Who developed the theory of evolution?

- a. Albert Einstein.
- b. Charles Darwin.
- c. Marie Curie.
- 2. The stem should be stated simply, using correct English.
- 3. Avoid use of direct statements from textbooks.
- Avoid use of trick and ambiguous questions.

Poor: In what year did Darwin visit the Galapagos?

- a 1831
- b. The calendar was inaccurate then; the year was actually 1832.
- c. Darwin was not the only one to visit Galapagos.
- d. Darwin visited Galapagos sometime between 1831 and 1836.
- 5. Avoid use of negatives such as none or not. If they must be used, underline or capitalize them.

Poor: Which of the following is not a mammal?

Better: Which of the following is NOT a mammal? OR All of the following are mammals EXCEPT.

6. All alternatives should be grammatically related to the stem

7. All alternatives should be listed in some logical numerical or systematic form.

This is less confusing to the students and decreases the probability that he will make careless mechanical errors.

How many legs do spiders have?

Poor:	Better
a. 6	a. 3
b. 4	b. 4
c. 3	c. 6
d. 8	d. 8

8. The length of the alternatives should be consistent, not vary with being correct or incorrect. Test-wise students know that the correct answer is often the longest one with the most qualifiers.

Poor: The function of the villus is to:

- a. Absorb digested food.
- b. Transport non-lipid soluble materials across a concentration gradient of the plasma membrane by active transport.
- c. Remove foreign particles or antigens from the gastrointestinal tract by phagocytosis and subsequent degradation.
- d. Aid cells in synthesis and packaging of certain digestive enzymes to be secreted into the duodenum for the hydrolysis of carbohydrates such as starch.
- 9. Avoid use of wordy stems.
- 10. Avoid use of verbal clues such as a, an.

Poor: A scientist who studies stars and galaxies is called an:

- a. botanist
- b. geologist
- c. astronomer
- d. physicist

Better: A scientist who studies stars and galaxies is called **a/an**:

- a. botanist
- b. geologist
- c. astronomer
- d. physicist

- 11. DO NOT use response alternatives such as "none of the above," "none of these," "both (a) and (c) above," or "all of the above."
 - "None of the above" may measure only the student's ability to recognize incorrectness.
 - "All of the above" may be a giveaway if a student recognizes more than one correct alternative. Also a student may recognize a correct response and mark it without reading down to the "all of the above" alternative.

Poor: Albert Einstein was:

- a. A physicist
- b. A mathematician
- c. A Nobel Prize winner
- d. Both B and C above
- e. All of the above

(Which of these alternatives is a wrong answer?)

12. When testing for knowledge of a term, it is preferable to put the word in the stem, and alternative definitions in the response alternatives.

Poor: A particle found in most atomic nuclei is referred to as a/an

- a Proton
- b. Neutriolos
- c. Electron
- d. Neutron

Better: A neutron can best be defined as:

- a. Any number equal to zero
- b. A negative particle found in atomic nuclei
- c. A neutral particle found in atomic nuclei
- d. A part of most atoms we know about
- 13. Each alternative should be independent so as not to give clues to answer another alternative.
- 14. All alternatives should be written so that they are all plausible to the less informed student.

15. Be aware of bias and sensitivity issues.

- content that may adversely affect a specific group of individuals
- content that may advantage a certain group of individuals
- avoid use of student names (use "the student" instead of "Bob")

16. Use appropriate vocabulary

- a. age appropriate
- b. words found in "Science Terms Students should Know"
- c. words students were held responsible for in previous courses
- d. words found in "ie's" in objectives

17. Alignment

questions need to align to Standard Objective ILO